



The U.S. Environmental Protection Agency's **ENERGY STAR® Homes Program** promotes the use of high-efficiency technologies and equipment. ENERGY STAR Homes use at least 30% less energy than homes built to meet the national Model Energy Code while maintaining or improving indoor air quality. These fact sheets are designed to help consumers learn more about the energy-efficient improvements to their ENERGY STAR Homes.

EXHAUST VENTILATION SYSTEMS

MECHANICAL EQUIPMENT IMPROVEMENTS

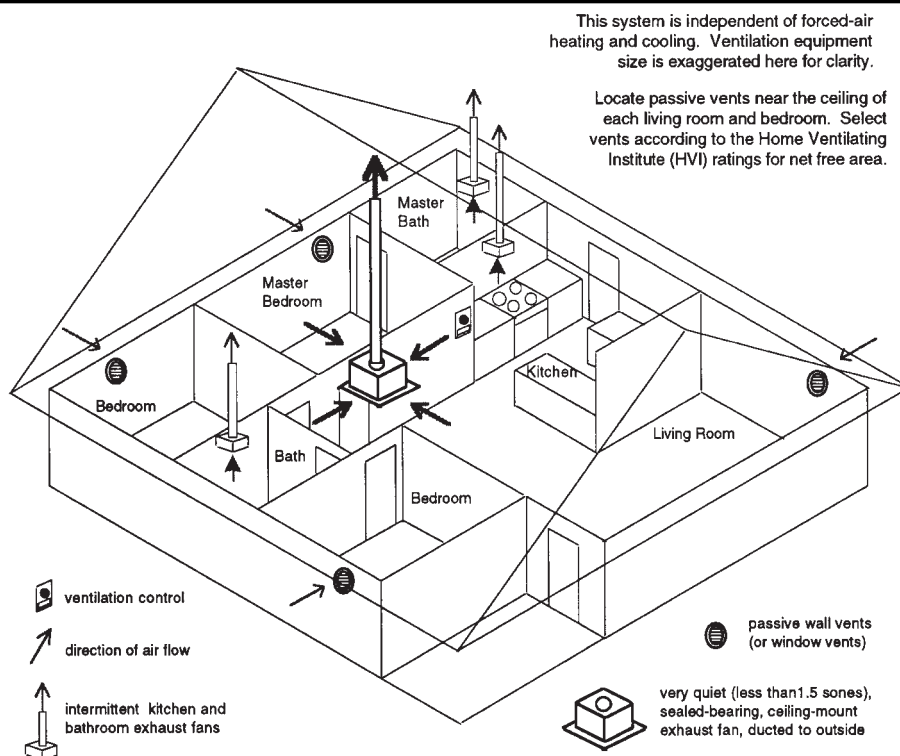
The air within homes can become stale from moisture, odors, and pollutants that penetrate the home or are generated internally by human activity and out gassing from building materials and furnishings. A constant supply of fresh, outdoor air can provide greater assurance of good indoor air quality and improved comfort.

In most homes, ventilation is provided accidentally when air leaks through the building envelope. Accidental ventilation is unreliable because it is dependent on a pressure difference between indoor and outdoor spaces caused by temperature or wind variations. Too much fresh air often enters a house during cold weather causing uncomfortable drafts and high heating bills. Not enough fresh air may enter during mild weather which can lead to poor indoor air quality.

Air leakage through the building envelope accounts for between 25 percent and 40 percent of the energy used for heating and cooling in a typical residence. Many new homes are being air sealed to reduce this energy use. Where tighter construction reduces air leakage and accidental ventilation, active ventilation systems may be needed to provide fresh air.

Figure 1 shows how exhaust ventilation works in a small home. Indoor air is continuously exhausted from a central fan (shown) or remote fans usually located in bathrooms. Fresh outdoor air can be drawn into the house through remaining leaks in the building envelope. Homes built with extremely tight envelopes may require the installation of room wall ventilation openings or specially designed windows that allow outdoor air to enter. These openings are sized and located to allow the proper amount of fresh air to enter homes without causing uncomfortable drafts and to prevent indoor

FIGURE 1: SCHEMATIC DIAGRAM OF EXHAUST VENTILATION SYSTEM



EXHAUST VENTILATION SYSTEMS

MECHANICAL EQUIPMENT IMPROVEMENTS

RESOURCES

The Consumer Guide to Home Energy Savings (Wilson and Morrill). Available from the American Council for an Energy Efficient Economy at 510-549-9914.

The following fact sheet is available by calling the U.S. Environmental Protection Agency's toll-free ENERGY STAR Hotline at 1-888-STAR-YES (1-888-782-7937): ***Air Sealing***.

Moisture Control in Homes fact sheet available from the Energy Efficiency and Renewable Energy Clearinghouse (EREC), P.O. Box 3048, Merrifield, VA 22116, 1-800-DOE-EREC (1-800-363-3732)

(CONTINUED)

pressurization. Kitchens should have separate, manually operated, exhaust fans.

The advantages of exhaust ventilation are control and consistency. Moisture, odors, and pollutants are removed continuously, regardless of weather conditions. High indoor air quality is maintained due to the constant infiltration of outdoor air.

Exhaust ventilation systems are most suitable for moderate climates. Care must be taken during design and installation to prevent these systems from “back drafting” dangerous combustion gases from fireplaces and gas appliances into homes.

BENEFITS

Exhaust ventilation systems can provide many benefits including:

Improved indoor air quality. Exhaust ventilation systems continuously remove moisture, odors, and pollutants. This proactive approach to ventilation can result in improved indoor air quality.

Improved comfort. ENERGY STAR Homes with tight construction and exhaust ventilation systems can have fewer drafts and a constant supply of outdoor air, resulting in improved comfort.

Improved health. Stale air can cause health problems. It can be responsible for symptoms such as headaches, drowsiness, and respiratory problems. These symptoms are more common in homes with poor ventilation and moisture control. Continuously providing fresh air can result in the improved health and well-being of the occupants.

Lower utility bills. Less energy is consumed to operate ventilation systems than to heat and cool excessive amounts of outdoor air that infiltrates leaky homes. This can result in lower utility bills, making homes less expensive to operate.

Improved resale position. ENERGY STAR Homes with exhaust ventilation systems can provide the many impressive benefits listed above including more